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A Ship Illuminated by Gas.

Some necessary operations connected with ship building are now being conducted in Liverpool, highly characteristic of the progressive spirit of the age. Messrs. Humble and Gruyson having contracted to execute the fastenings of the clipper ship "Shooting Star," 1500 tons burden, lying in No. 2, Queen's Graving dock, the time being limited and the days short, they conceived the idea of introducing gas into the body of the vessel, in lieu of the blinking lanterns generally in use. After the usual difficulties in getting the consent of large public bodies, it was at length obtained of the dock committee, harbormaster's committee, town surveyor, directors of the gas company, and the police; and a main pipe having been laid on from the shore, the hold was brilliantly lighted up by 14 common street lamps, and the 'tween decks by six, enabling the workmen to guide their operations even better than by daylight. The fastenings are of a rather novel kind, comprising not only the usual number of iron knees, but a double set of oak diagonals additional. The size and beauty of the vessel, the peculiarity of the work, and the novel means of illumination, excites much interest. She will be completed in about a fortnight.—[Liverpool Mercury.

Incrustations of Boilers.

The following receipt for preventing incrustations in steam boilers was published in Vol. 7, "Scientific American," and is only republished at the request of a new subscriber, who says he is confident it will be of immense benefit to many of our readers, as he had tried it once on the recommendation of a friend, but had lost the receipt, and when he came to make up the compositition from memory he found out that something was forgotten:—

"Take 32 gallons of coal tar, 21 gallons of linseed water, 5 pounds of black-lead in powder, and 8 pounds of common soap, and mix these ingredients intimately together by stirring them in an iron kettle under a gentle heat. When they are well mixed and of a creamy consistency, they are fit for use. This composition is to be applied to the boiler after the steam is blown off in about the proportion of one gallon to a thirty horse boiler. This quantity is simply introduced through the man hole every four days when the water is very hard. This composition, it is said, will loosen incrustations which may have formed on the boiler, so that they can be swept out; and it will, while used, prevent the sediment from adhering to the boiler in the form of hard scale. The linseed water is prepared by boiling 14 lbs. of linseed by means of steam heat, then straining the water through a cloth. The above proportions being retained, any quantity from one to fifty gallons can be made at once.

Import of Sperm and Whale Oil.

The import of Sperm and Whale Oil into the United States, during 1853, was 103,077 barrels, and for 1852 79,950 barrels. Of Whale oil the import in 1853 was 260,114 barrels, and in 1852, 83,775, showing an aggregate increase in the import of sperm and whale oil for the present year, of 199,466 barrels, or more than the entire import of 1852.

BUSHNELL'S SELF-FEEDING HAND DRILL.

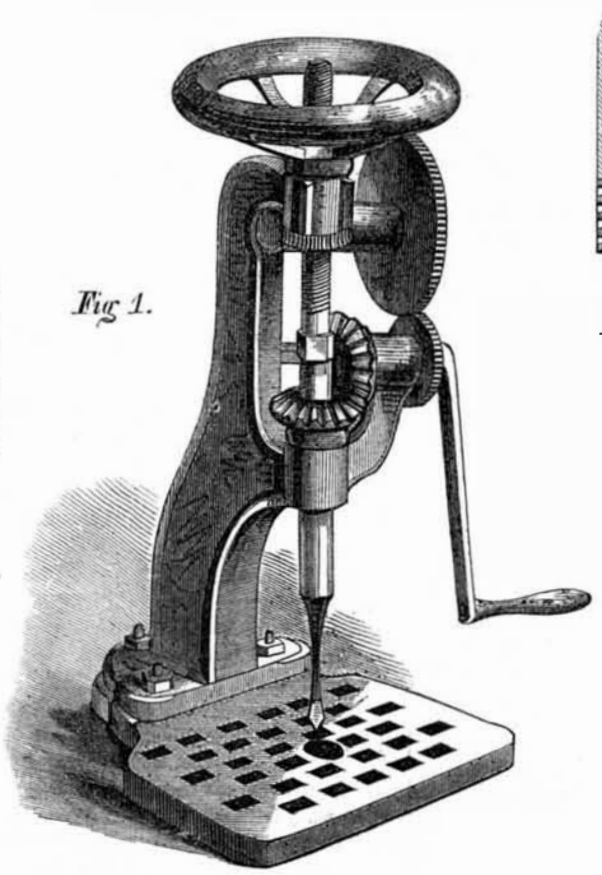

Fig 1.

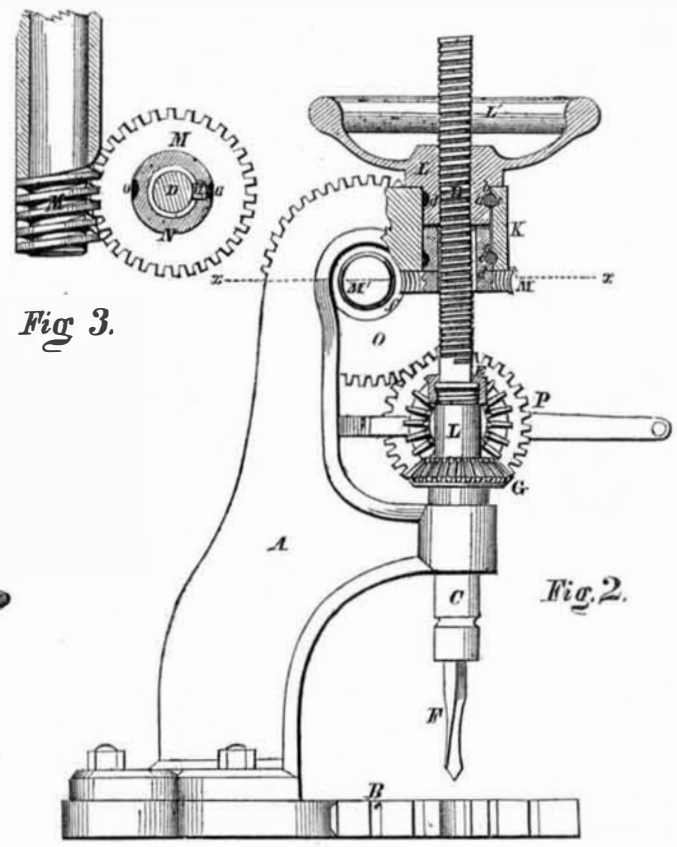

Fig 3.

Fig. 2.

The above engravings are illustrations of an improvement in machines for boring metal by hand, invented by Wm. Bushnell, of this city, a notice of which appeared in our paper two weeks since.

Figure 1 is a perspective view; fig. 2 is a side view, partly sectional, and fig. 3, a section through the line, *x x*. The portion of the standard above this line is removed in the side elevation to show the arrangement of the gearing.

In many other hand drills for boring metal, springs or weights, are employed for facilitating their operation by acting as feeders. These devices answer a good purpose until the hole is bored nearly through, when owing to the great force they constantly exert, they cause the tool to escape suddenly through the iron, and consequently cause the metal to chip or break off; this difficulty is removed in this drill, as the force is exerted in such a manner as to insure a steady feed proportionate to the rapidity with which the tool revolves.

A represents the standard or frame in which the operative mechanism is arranged, as shown in fig. 2. This frame is cast in one piece and bolted to the perforated base plate, B, suitable bearings being cast upon it to sustain the working parts. The drill spindle is made in two parts, C D, which are coupled together by the nut, E. The lower part, C, carries the tool, F, and is made to revolve rapidly, independent of the screw part, D, by means of the two bevel wheels, G H, which receive motion from the driving shaft, J. One of these wheels, G, has a key working in a slot, upon the shaft, turning with it, but allowing it to descend gradually. The driving shaft, I, which carries the wheel, H, rests in the bearing, J, cast upon the frame. D, the upper part of the spindle, forms a screw which passes up through the central box, K, of the frame. In this box the nut, L, of the elevating wheel, L', fits and turns loosely, being about half the depth of the box, it has a shoulder resting upon the top of the box, and also a semi-circular groove, *d*, cut in its periphery, corresponding with another in the box, which when brought together, form an annular ring for the pin, *c*, to fit in, which pin confines the nut to its place.

M is a horizontal worm wheel, and M' is a worm for driving it upon the shaft to which the handle is attached. This wheel has a hub, N, projecting from its upper surface, and is fitted loosely over the screw, D, at the spindle, its hub passing up in the box, K, until it meets the bottom of the nut, L', it is keyed to the screw by the key, *d*, and also secured in the box, K, in a similar manner with the nut, L'. The screw has a key seat or groove, *d*, cut in it along its whole length, in which the key, *d*, which connects the worm wheel, M, with the screw, D, slides freely as the screw moves up and down.

The shaft of the worm, M, turns in the upper box, *f*, of the frame, A, and its connection with the remaining mechanism can be clearly seen. By means of it a slow downward motion is communicated to the drill spindle simultaneously with the rotary motion which it receives through the wheels, O P, and the bevel wheels, G H. By the arrangement of the parts, all the mechanism of the drill can be actuated by a single crank.

This drill is a superior article, and we can cheerfully recommend it to our readers. Its parts are well arranged, and it is constructed in a workmanlike manner. A few of them have been left at our office for sale, and we will ship them to the address of any person remitting $25.

Cinder Basket.

This engraving exhibits this useful little invention, patented in England by Mathhias Walker, with its side and cover partially broken away, to show the internal arrangement. The cinders and ashes to be separated are shovelled into it by the large end door, A, and they thus fall on the curved incline grating, B. Then by shaking the basket, the ashes fall through the grating, and may be emptied by the small end door, C, whilst the cinders remain in the basket for use. The basket presents a very neat exterior; and, as it is all covered in, no dust can rise during the process of sifting. Besides, it effects considerable economy in the cinders.—Mr. Walker has also patented an important contrivance applicable to barrels and other fluid-containing vessels. This arrangement, which he terms a "hydrostatic vessel," consists in encircling the vessel with an outer case, filled with a cooling fluid, so that the actual contents of the vessel are well defended from atmospheric influences, and are kept fresh, cool, and at a uniform temperature.

The Maryland Coal Trade the present year has amounted to over 559,331 tons.

Tobacco at the North.

The Culture of the weed in Connecticut is becoming extensive and profitable. In many o the river towns, tobacco is the principal crop grown. In order to promote its culture, a company has been formed in Hartford, with a capital of $25,000, for the purpose of opening a Tobacco Inspection Warehouse in that city, to be governed by a large board of directors, president, etc., representing the various tobacco growing districts. The capital invested is to be used to buy or advance on crops in growth; and the company is to provide suitable warehouses in which to pack, inspect and store the crops that may be consigned to them; to keep the same insured, and hold till fully cured, then to sell and pay over the net proceeds to the owners. The tobacco crop is an exhausting one.

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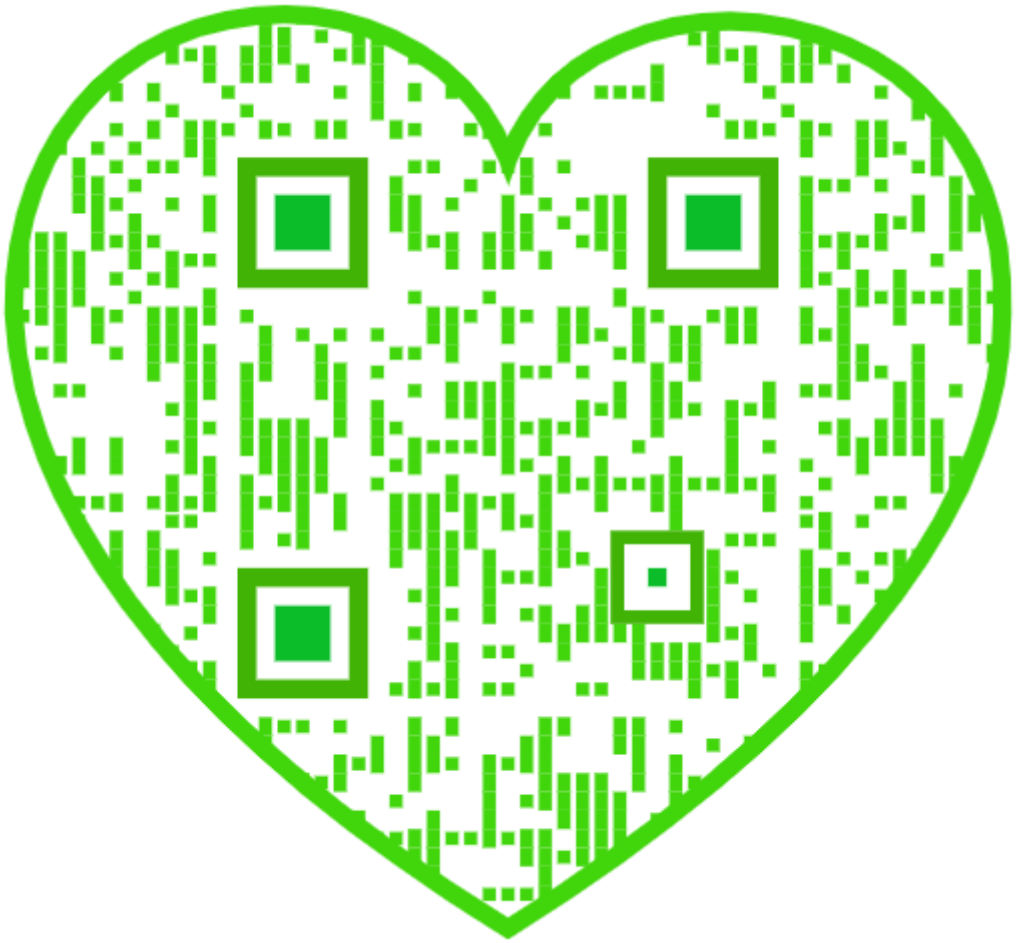

Imponderable Agents.---No. 7.
[Second Series.]

LIGHT, ELECTRICITY, AND HEAT—Prof. Faraday has proven, that there is a near and intimate relationship between light and electricity, and the theory has been put forth that light, electricity and heat are identical in their nature, though different in their effects. Light whether solar or terrestrial produces heat, and powerful combustion, always produces both light and heat. Light heat and electricity are produced by an electric machine, and the results of different actions of the electric current; charcoal presented to an elecric current produces light. The light emitted by the deflagration of metals at the poles of a battery, varies in color with the nature of the metal. Thus silver produces a beautiful green light, copper a bluish white with red sparks, and lead a beautiful purple.—When the poles of a battery, consisting of numerous series of large plates, so as to develope an electric current of considerable quanity and intensity, terminate in charcoal points, the most brilliant light which can be made artificially, is emitted, whenever those points are brought into contact. And if they be gradually drawn apart, the current will still continue to flow between them through the rarified air, even at the distance of several inches, forming an arch of light of dazzling brightness, in which the most refractory substances, are either fused or deflagrated. This light is not produced by combustion for the charcoal is not burned, and the two points weigh nearly the same both before and after the experiment though there is a transfer of matter from one to the other in a vitrified state. It was at one time supposed that the deflagration of metals could only be produced by very large and powerful batteries, but Dr. Wollaston proved this idea to be incorrect by means of a battery made of a lady's thimble, with which he fused a very fine platinum wire. He thus proved, that the only condition requisite to produce intense heat by the electric current, is that the conducting wire should be of insufficient size to transmit freely, the quantity of electricity generated by the battery. Thus it appears that light, heat, and electricity, are related so intimately that it would be presumptuous to claim for each a separate individuality.

It has not been actually demonstrated that light, heat, and elctricity are one substance exhibiting different qualities under different conditions, and indeed so many objections may be urged against such an idea, that it is better not to put forth any dogmatic opinions on the point. But the objection "that one substance cannot possibly exhibit so many phenomena under different conditions," which has been urged against, the *one* substance theory, is just as good against light and electricity in themselves, or in their union. Thus there are three totally distinct colors produced by the different actions of a ray of light, and both heat, light, and electricity, are developed in a single ray, and a ray also exhibits, chemical and non-chemical qualities. The phenomena of light are exceedingly numerous; and embrace a very extensive range of science. It is the same with electricity, the electric current exhibits both chemical and mechanical phenomena, it produces light and heat, and exhibits all the varied colors in the solar spectrum according to the media employed. Heat is almost a ponderable, and yet is as subtle in some respects as light and electricity. Heat and light are generally associated together.

Hay Meal.

It is now becoming common to grind corn with the cobs, and many consider such meal to be, on the whole, more valuable than that made from the corn alone. A writer in the Germantown Telegraph proposes to go a step further and grind hay. He says:

"I have no doubt that a meal made of hay, or even of cornstalks, would possess sufficient additional value over and above the raw material to defray the expense, and I have no question that before many years, hay ground or hay meal, if it be not too absurd to use such a term, will be as common as indian meal or rye meal now is. I have some facts to communicate hereafter in reference to this matter, which I think will be interesting to your readers. We are in the 'midst of a revolution,' in farming affairs, and are beginning to look around us with our eyes open for the light I trust."

The Bull-Rush Caterpillar of New Zealand.

HAMLET—"There are more things in Heaven and Earth, Horatio,"
Than are dreamt of in your philosophy."

About eight or ten years ago, a notice appeared in the "Athenæum, of certain transactions at a meeting of one of the Scientific Societies in London, at which meeting, if we be not greatly mistaken, it was stated that Professor Owen had described an insect, a species of Caterpillar indigenous to New Zealand, which was in the habit of running about with a young tree growing out of its body—that the insect sought for a soft suitable soil, and then and there buried itself, thus planting out and extending the forest.

We do not pretend o recollect, with sufficient accuracy to repeat here, the very words said to have fallen from the learned lecturer; we may be taking liberties with the language, but our impression is, as we have written it, and having considered it at the time, as very curious if true, we hung up the whole lot, New Zealand Forest, Professor Owen and the Caterpillar, on a little peg in a corner of our brain, to be taken down and examined when an opportunity offered.

* * * * * * * *

Some years afterwards found us on the Southern side of the Mountains of Lebanon, not far from the Cedars of Solomon; and here, by chance, we fell in with a traveller, wending his way through Syria; he was a good-natured jolly way-farer, and, when informed that we were from Bengal bound to Pennsylvania, laughingly told us he was from Glasgow, bound to New Zealand.

He obtained the benefit of our experience and geographical knowledge as to the most interesting path to follow on his journey through the Holy Land, and when we parted (remembering the lot hanging on the little peg), we asked him to send us, as an especial favour, an insect such as that described above; the Scotchman smiled, but promised; and a few days ago we received from Auckland, New Zealand, a little box, with the flowery label of "Premier qualite Eau de Cologne," and this box contained the much-wished-for Animo-vegeto-Bull-rush Caterpillar.

Our friend unfortunately tells us very little of this interesting production, merely observing that he had procured the vegetable phenomenon from the North of the island of New Zealand, near the extensive wooded plains; that is only found in one locality and under one particular tree, called by natives "Rata;" that at first it appears as a parasite, but at last it kills the tree to which it clung, and extending itself, becomes no mean occupant of the forest.

Being greatly interested in the subject, we have endeavoured to find out all that has been written about it by travellers and men of science, and before recording the opinion formed from such evidences as we have been able to produce, we will detail such information as we have collected in our researches.

In Dr. McClelland's "Calcutta Journal of Natural History," Vol. VI., for April 1845, at page 71, there is a description of this interesting insect, under the title of the "Vegetable or Bull-rush Caterpillar," by Dr. Thompson, of the British Hospital, Damascus. Dr. Thompson calls it a very remarkable plant, and "one of the most curious vegetable productions with which we are at present acquainted;" to this paper an illustration is annexed, giving a very accurate representation of the dried specimen, such as we now see it; but the subject of the paper is called on the plate the "Sphœria Robertsii," and the description commences as follows:—

"There are birds which dispossess others of their nests, and marine animals which take up their abode in deserted shells; but this plant surpasses all in killing and taking possession, making the body of an insect—and that too in all probability during the life-time of the insect the origin from which the future plant rears its stem, &c., &c. We may therefore look upon this vegetable as one of the most surprising links between the animal and vegetable kingdom. The natives call it "Amato Hotete," and it is only found at the root of one particular tree, the "Rata." There are no leaves, a solitary stem comprises the entire plant, and should this stem be, by accident, broken off, a second stem arises from the same spot, which is one of the peculiarities of this plant, and not known to occur with any other plant with which we are as yet acquainted in the vegetable kingdom.—The body is not only always found buried, but the greater portion of the stalk as well; the seed vessel alone being above ground. The vegetating process invariably proceeds from the nape of the neck, &c., &c., &c."

It is, therefore, very clear, that Dr. Thompson, although he seems satisfied, relative to the link between the animal and the vegetable, does not believe that the Sphœria Robertsii extends beyond the little bull-rush head, which just peeps above the ground. Let us, therefore, hear what is said about it by travellers who have examined it (or ought to have done so) in its native region.

The Hon'ble Captain Keppel, in his "Voyage of the Meander to the Indian Archipelago, Vol. II., pages 151—154, quotes from "Remarks by the Rev. W. Taylor of Warinote," New Zealand; and the remarks are nearly word for word the same as Dr. Thompson has chosen in the dscription we have referred to.

Both writers commence in the same strain:—"There are birds which dispossess others of their nests, and marine animals, &c.——" and the phraseology continues throughout to prove that the original of both discriptions is from one and the same pen. Dr. T. does not tell us from whence he obtained his information, but in all probability, the resident at "Warinote" furnished the particulars; it not being very likely that the physician of Damascus supplied such intelligence to the learned New Zealand Colonist; this, indeed, would have been carrying coals to Newcastle.

In a work recently published, 1853—"W. Tyrones Power's three years' Residence in China," chap. 31, page 350, we find the "Parasites" which cover the trees (of New Zealand) are in many instances extremely beautiful.—The "Tana" is by far the most remarkable one; it first assumes vitality in the body of a Caterpillar, somewhat larger and thicker than a silkworm, into which it has probably found its way as food; the young sprout quickly absorbs the vital moisture of the insect's body, in changing it in a ligneous substance, resembling in material a dried chesnut; in this state it forms a root to the plant, which curls its delicate tendrils round some forest tree, as the ivy round the oak. Rapid in growth, it becomes each day stronger and stronger, till crushing to death, in its iron embrace, the pillar which supported its youth, it stands alone, one of the finest and most vigorous of the forest trees, and perhaps the most valuable for the timber, which is hard, tough, and crooked, is the best suited for knees of ships, and the like purposes.

One more quotation from the Hon'ble Captain Keppel of the "Meander," or Dr. Taylor of Warinote, or Dr. Thompson of Damascus—the "Tria juncta in uno:"—

If these views should be corroborated by future investigations, and found to be correct, the case of these plants, and changes produced, will be an instance of a retrogade step in nature, where the insect, instead of rising to the higher order of the butterfly and soaring aloft to the skies, sinks into a plant, and remains attached to the soil in which it buried itself."

"Corder," the celebrated German naturalist, in his elaborate work, the "Icones Fungorum," describes this curious formation as the "Lphœria Robertsii," from an account received from Baron Hugal, and a dried insect; in his opin ion, the "Fungus" arises from the dead body of the Caterpillar, and the apparently ligneous fibre is nothing more than "mysellium," which fills up the body of the animal.

And now, here we have it before us—seven beautiful specimens, and all agreeing in their general appearance; and we may therefore examine at our leisure, and then form our own conclusion. There cannot be any mistake about the Caterpillar—it is the larva of a butterfly, or a moth; its identity is not the least destroyed the insect is dried up, of course, but it is quite perfect in all its parts, from three and a half to four inches long, and somewhat thicker than a swan-quill. The head is formed very much like the head of the tusser silk-worm; its horny covering, and the hardened mandibles, remain entire, and from near the "posterior" extremely of the insect's body, a single shoot of the ligneous fibre springs forth from eight or nine inches in length, surmounted by a top resembling the head of a bull-rush in miniature.

This preternatural production is beyond all doubt Fungus—the "Sphœria Robertsii" as described; and never advances beyond the excrescence as we now see it. It cannot grow into a tree, it cannot bear a leaf, it is of the very lowest order of plants, (it plant we may call it), and as a humble member of the Fungus family, is unable to claim relationship with any vegetable in a higher position than a mushroom.

The "Sporules," floating in the air, may fasten themselves upon the Caterpillar while it is seeking for a hiding place, in which to undergo its transformation; and finding a suitable soil in the insect's body, destroy life with their growth, and finally fill up the carcass with the white spongy substance which dissection discloses. The friends we have quoted must have been mistaken if they referred altogether to our Caterpillar; but why should there not be another insect as willing to carry about a seed, as this one has been so bury itself with a Sporule? Or it may be, that a parasitic plant, the seed of which has been transported either by an insect or a bird, seizes upon a fitting resting place, and when grown apace, "crushing to death, in its iron embrace, the pillar which supported its youth, stands alone."

We need not travel far in this country to see how often the seed of the "peepul" tree takes advantage of the crevice in a wall, or the neglected masonry on the deserted house top, and how securely it plants itself, and how vigorously it advances.

* * * * * * * *

Before we leave this subject for the present, let us turn to "Maunders's Scientific and Literary Treasury," London, 1848—Article Pojojoy—

"In September, 1839, at the ordinary scientific meeting of the Zoological Society, the first communication read was a letter from Mr. Mackay of the British Consulate at Maracaibo, on a plant called "Pojojoy," in the country from which it is derived, and which arrives in this state from the strange metamorphose of an insect. In the insect which was described, some of the legs had been already changed into roots, and in this state it was presented to the contributors. It was announced that a similar insect had been discovered in North Carolina, which assumed alternately that form, along with a plant; when this hybrid creature assumes the form of an insect, or animal, it is about an inch in length, and much resembles a wasp in appearance; when the insect has attained its full length, it disappears under the surface of the ground and dies; soon after which the hindlegs begin to sprout and vegetate, the shoots extending upwards, and the plant in a short time reaching the length of six inches. The branches and the leaves are like the trefoil, and at the extremities of the former, there are buds which contain neither leaves nor flowers, but an insect, which, as it grows, falls to the ground, or remains on its parent plant, feeding on the leaves till the plant is exhausted, when the insect returns to the earth, and the plant shoots forth again."

We must be cautious when we attempt to pry through the veil which as yet conceals so much of the wonderous mysteries of creation! But we do wish, that somebody would send a "Pojojoy" to CHAS. HUFFNAGLE.
U. S. Consul.

Calcutta, Doorga Pooja Holidays, 1853.

Australian Enterprize.

The interior of Australia, a barren and sandy desert, has been found to be considerably below the level of the sea. It is now proposed to employ British convicts in cutting a narrow canal from the ocean to the desert a distance of about 250 miles, when it is expected that the rush of water would be so great as to widen the canal and cause the formation of an inland sea almost as large as the Mediterranean, to the incalculable benefit of a vast extent of territory at present wholly useless.

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[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 10, 1854.

SPIRAL OR WORM JOINT HINGE.—P. G. Bates, of Waterbury, Conn.: I claim the spiral or worm joint hinge constructed as described.

SALIVA PUMPS.—By F. Davison, of Liberty, Va.: I claim drawing the Saliva from the mouth and keeping it dry during the operation of filling teeth, by means of an instrument constructed with a hollow mouth piece, which connects with a tube and suction and force pump, as described.

MACHINES FOR PEGGING BOOTS AND SHOES.—By J. J, Greenough, of New York City: I claim, first, cutting the peg from the peg blank, by a lateral motion of the cutter against the side of the blank—the cutter assisting to hold the blank in position, while it is driven as described.

Second. I also claim the combination of parts, consisting of a revolving plate, surmounted by slides, moving at right angles to each other, when this is combined with the resting of the axis of the revolving plate upon a weighted lever, or its equivalent, so as to rise and fall, for producing a universal movement carriage, as described.

Third, also the center guide for directing the movement of the shoe or other article in the course indicated by the groove or other device substantially the same, for the purpose of keeping the line of the pegs, coincident with that of the awl and peg driver.

Fourth, I also claim so constructing, arranging and operating the shoe carriage that each point of the sole which is to receive a peg, shall be brought successively to the same point under the stationary pegging standard, so that the pegging shall be effected automatically and without interruption entirely around the shoe or other article as described.

Fifth, also, in combination with the movable carriage, the stationary pegging standard, made adjustable, so that it can be set at any required distance from the center of motion of the carriage holding the material to be pegged as above set forth, so that a second row of pegs may be driven within the first row, with the same pattern as described.

Sixth, I also claim driving the pegs by a tool having a positive motion as described in both directions.

I wish it distinctly understood that I do not intend by the above claim to secure or have granted to myself any device or combination contained either explicitly or substantially in letters patent granted to Joel Robinson, dated October 31st. 1848.

DIAPHRAM PUMPS.—By Daniel Hitchcock, of Warren, Mass.: I do not claim the pinching of the diaphram between plates with parallel sides, as this has been done before, but I claim the securing of an elastic diaphram between the plates, the sides of which are so inclined as to gradually compress the diaphram and take up its elasticity by which means it is prevented from cutting as described.

MANUFACTURE OF BOOT AND SHOE SOLES OF GUTTA PERCHA OR INDIA RUBBER.—By E. C. Hyatt, and C. Meyers, of Milltown, N. J. we claim, first, producing a shoe sole or other analogous manufacture in india rubber or gutta percha, in one piece having variety of thickness in different parts, by the use of rollers whose surfaces present the reverse of the forms to be produced at a single operation substantially as described.

Second, forming soling of india rubber or gutta percha with shanks fore part and heels of appropriate difference of thickness in one solid piece, and at one operation, as described.

Third, We also claim forming such soling or analogous manufacture in continuous sheets at one operation by rolling as described.

MACHINES FOR MINCING MEAT.—By Abraham McInlurf, of Liberty, Va.: I claim the employment of the compound cutters, as herein described in combination with the holders, operating substantially as set forth.

PILL MACHINES—By O. G. Merrill of New Bedford, Pa.: I claim the combination of Machinery described in my specification, as follows, to wit: I claim the revolving segment with the arrangement of lever and ratchet attached moving the knife in the manner described: also the peculiar operation of the fingers which support the pill worm, until the proper time for dropping it between the segment and concave, with the coating box attached and moved as aforesaid, or any other arrangement of machinery substantially the same and which will produce the intended effect.

APPARATUS FOR INDICATING THE ACTION OF THE FEED PUMP IN STEAM BOILERS —T. J. Sloan, of New York City: I claim combining with the motor which operates the supply cock or valve and with the supply, or with either as specified, which when the same motor and pump or either fail to operate the valve of the whistle or other alarm to give warning that the apparatus needs personal attention with the view to perfect safety as specified.

PHOTOGRAPHIC PLATE VICE.—C. M. Stimpson, of Cleveland, O.: I claim the bed plate, with the rings in combination with the carriage plate, with the projection and T head and lip, E, operating in conjunction with the lip, F, upon the main frame. I also claim the manner of securing the carriage plate to the ways by means of the slot and T head, and moving the same backwards and forwards upon the ways, by means of the eccentric or cam lever, in the manner specified: I also claim the arrangement by which the carriage plates can be changed from one side to another, simply by bringing the lever arm back to its farthest point to the left, or in the direction opposite to the course indicated by the arrow.

I disclaim the lips, and the cam lever separately considered, but I claim the several parts in combination.

TONSIL INSTRUMENTS.—Ira Warren of Boston, Mass.: I claim as my invention in an instrument for the excision of the tonsils, and other analogous operations, the crescent shaped blades, constructed and operating in a manner substantially as described and for the purposes set forth.

AMPUTATING APPARATUS—By G. W, Griswold, of Carbondale. Pa.: I claim the combination of the adjustable rest, movable disc, and guide or standard, for holding the bone, retracting the flesh and guiding the saw, in amputating limbs, the whole being as described.

CLASPS—By C. T. P. Ware (assignor to David C. Morehead), of New York City: I claim the spring clasp lock so constructed and arranged that the laps shall, when closing, depress the wide end of the tongue, and allow it at last to spring outward into the enlarged space between and above the laps, where it is held firmly by the turned over end of the tongue, or by the thickness of the metal itself, whether used with the projections or without them.

TRUSSES—By L. B. White, of Moscow, N. Y.: I claim the knuckle, the stirrup, the spring, the effect of the bow as set forth.

DESIGN.

LAUNDRY STOVE—By Wm. Resor, of Cincinnati, O.

[The following claim was omitted at the Patent Office while making up the list for Dec. 6, 1853.]

GRAIN HARVESTERS AND BINDERS—By P. H. Watson & E. S. Renwick, of Washington, D. C. Ante dated June 6, 1853: We claim, first, the combination of a continuously acting rake. with a binding mechanism acting intermittently, as set forth, which, among other things, gives the director of the machine an opportunity to observe the rate at which the grain for each sheaf is accumulating, so that by hastening or retarding the operation of the binding mechanism by shifting the belt on the cone pulleys, he can make the sheaves nearly of uniform size.

Second, the method of compressing the loose grain into sheaves vertically instead of horizontally, by which, among other advantages, the lateral dimensions of the machine are considerably diminished which adapts it the better to running between stones and other obstructions. and enables it to cut the outside swath round a field with less trampling and waste of the grain.

Third, the shifting conveyor by means of which sheaves of varying length may be bound round the middle, without changing the relative positions of the cutting and tying machine, as set forth.

Fourth, the combination in a grain harvester of two series of bands, one or both armed with teeth, for the purpose of carrying the grain from the rake to the binder, as set forth.

Fifth, the combination of a shifting tripper with a conveyor, as set forth.

Sixth, the combination of the discharging gate or its equivalent, with the receiving platform and the binding crib, as set forth.

Seventh, the traveling cord nippers, or their equivalents, operating as set forth.

Eighth, the combination of the cord clamp, with the cord feeder, as set forth.

Ninth, the method, as set forth of drawing the binding cord round the sheaf with the proper degree of tightness preparatory to tying, by means of a spring operating upon the cord spool. as set forth.

Tenth, the traversing movement of the tying forceps in alternately opposite directions in combination with their opening and closing movement whereby the two ends of the band may be laid together, and may then be grasped by the forceps to be tied, thus dispensing with a finger to thread the cord through the eye of the forceps.

Eleventh, the pronged standard in combination with the tying forceps and the finger, or their equivalents.

Twelfth, the method of rendering slack cord to facilitate the tying of the band by lessening the diameter of the sheaf as the cord is taken up in making the knot.

Thirteenth, the arrangement of the cord nippers upon a sliding stock pressed down by a spring which yields to allow the stock to stand still while the compresser which carries it, is moving as set forth.

Fourteenth, the retarding of the cord by means of a brake, or the equivalent thereof applied to some point between the place at which the knot is tied and the extremities of the cord, to ensure the stretching of its ends, across the loop preparatory to their projection through it in the operation of tying the knot, as set forth.

Fifteenth, the arrangement of the sides and bottom of the binding crib, so that it can be depressed to permit the discharge of the sheaf, as described.

Sixteenth, the arrangement of the cutting and binding mechanism on opposite sides of the driving wheel, as set forth.

Why do Teeth Decay.

All the theories that time and again have been advanced in answer to this enquiry, have long since vanished before the true doctrine of the action of external corrosive agents. The great and all-powerful destroyer of the human teeth is acid, vegetable or mineral, and it matters not whether that acid is formed in the mouth by the decomposition of particles of food left between and around the teeth, or whether it is applied directly to the organs themselves: the result is the same, the enamel is dissolved, corroded, and the tooth destroyed. Much, very much of the decay in teeth may be attributed to the corrosive effects of acetic acid, which is not only in common use as a condiment in the form of vinegar, but is generated by the decay and decomposition of any and every variety of vegetable matter. When we consider how very few persons comparatively, take especial pains to remove every particle of food from between and around their teeth immediately after eating, can we wonder that diseased teeth are so common, and that their early loss is so frequently deplored!—[Practical Dentist.

Quartz Crusher Experiments.

We were present, a few days since at some experiments made at the Allaire Iron Works, ty test the capability of Collyers's Quartz Crusher, illustrated by us in No. 15 of the present Volume. It was employed in crushing a quartzose rock from Lake Superior, very hard and tough, and it performed its duty admirably.—The powder produced was almost impalpable, and it seemed capable of performing a large amount of labor.

Californian Mastodon.

The bones of a mastodon were recently found in the neighborhood of San Francisco, at a depth of eighteen feet from the surface. They were imbedded in sand and gravel. At a distance of 80 feet from the surface the remains of a tree were found, and about twenty feet lower was a deposit of blue clay, with stones, rounded by the action of the water, showing that this was once, in all probabillty, the bed of the ocean.

Old Coins.

The New Haven "Register" says that in pulling down a very old house in New Haven, belonging to Harvey Stiles, coins were found in the crannies, one of which, a little larger than a silver dollar, is of a mixture of metals, but looks like iron—having a lion (rampant) for a device, and bears date 1047. A small gold coin, supposed to be of the reign of George First, and several old coppers, are among those found.

The Ten Hour Labor Law has passed the Kentucky House of Representatives.

The City of New Bedford is to be lighted with oil instead of gas hereafter, as a matter of economy.

[For the Scientific American.]

Illumination—Gas Light.

Allow me to offer a few remarks upon the subject of artificial illumination, suggested by the communication of Mr. Mascher. Sir Humphrey Davy proved, many years since, that the illuminating power of flame depends upon the number of particles of *solid* carbon which are suspended in, and intensely heated by the burning gas. All the illuminating gases being carburets of hydrogen, the power of combustion is as follows: where the supply of air is limited, so that the gas cannot all be consumed as it issues from its source ot supply it undergoes decomposition, the hydrogen is immediately consumed, while the carbon is set free in the flame and assumes its natural or solid form. The burning hydrogen heats the floating particles of carbon, and if the supply of air is sufficient to consume them, they burn without smoke and with the evolution of white light. The intensity of the light depends, of course, upon the quantity of carbon set free, and this explains why it is that oil gas, benzole, camphene, &c., the heavy carburets, or those which are highly charged with carbon, give off the whitest light in combustion, whenever the combustion is so regulated as to prevent smoke. If, however, the supply of air is unlimited, as is the case when air and gas are mixed, instead of there being carbon deposited in the flame, and the combustion of the two substances, taking place in *succession*, the hydrogen and carbon are burned *simultaneously;* no carbon assumes the solid form before combustion, and the flame instead of giving off white light, is consequently but faintly luminous. As the combustion is *complete* and *immediate*, the heat evolved must be more intense than in the first case, when white light was produced. Where the proportion of air is less than was supposed in the first case, the hydrogen is still consumed and the carbon set free; but as there is not a sufficient supply of oxygen present, much of the carbon rises from the flame unconsumed in the form of lampblack, while the flame itself assumes a dirty yellow color.

These being facts in relation to artificial light, let us see whether or not they will furnish a satisfactory explanation of Mr. Mascher's experments.

In the first experiment with the bladder, moderate pressure produced white light, as the supply of oxygen was insufficient to consume both hydrogen and carbon at once, but sufficient to consume them in succession. In the second experiment where the pressure was increased, the effect was, by forcing the gas out further into the air, to increase the supply of air, hence the carbon and hydrogen were both consumed immediately, and as no carbon was set free there was no light. The same reasoning applies to the case where air and the gas were mixed in the bladder. The effect of the sieve burner is, to cause air to be mixed with the gas before it is consumed above the wire gauze, so that the combustion occurs under precisely the same circumstances that it does when air is mixed with the gas; the use of the sieve burner is to secure immediate and complete combustion of the gas, by which smoke is avoided, and the maximum heat is obtained. If a simple gas jet is used to heat with, the substance to be heated must either be held so high above the flame as to lose a great deal of heat, or it must be put down upon the flame, when lampblack is immediately deposited. In the latter case the combustion ceases to be complete from the fact that the heating body excludes more or less air, hence the lampblack, and hence the lack of power in the flame to heat. There is as much difference between the sieve burner and the common one in the production of heat, as there can be between two furnaces for the production of steam; a perfect furnace consumes all of its fuel, and the boiler receives the benefit of it, while the poor one sends a large percentage of its fuel into the air as smoke—the sieve burner burns all its gas, and gives all its heat to the substance to be heated, but the moment a common jet is used for the same purpose, flakes of lampblack are deposited.

I would suggest, in conclusion, that as gas companies may at any time supply a gas of weak illuminating power, and may also adulterate it by mixture with air, gas consumers should protect themselves by having their gas examined occasionally by a competent chemist, to ascertain first what is the percentage of olefiant gas, and secondly to determine whether there is any admixture of air, and if so, to what extent. A few exposures would put an effectual check upon gas companies, and insure consumers getting what they pay for. WM. GILHAM.

Virginia Military Institute, Lexington, Va., Jan. 2, 1854.

Cancer Cured.

We have frequently noticed the remarkable cures of cancers, by Dr. Gilbert of this City (formerly of New Orleans) because this is a very peculiar and terrific disease, and any information which may be of benefit to the afflicted sons of men, we consider should be propagated far and wide. The success which has attended, Dr. Gilbert in curing this malady induces us to publish the following letter:—

NEW YORK, January 9th, 1854.

DR. GILBERT: Dear Sir—Laboring under—as I thought—an ulcerous affection, which, after consulting with a talented physician, I had exhausted all the remedies usually applied in such cases without the least relief, but all rather aggravating or increasing the disease, I determined to apply to you, having heard of and knowing from cases which came under my own observation of your unparallelled success in the treatment of such diseases. On your first examination you pronounced it "Fungus Cancer." and convinced me of the correctness of your opinion. Your application removed it by the root, without the use of the knife, which is the perfection of you treatment. Since which time it has healed rapidly, and my general health, which was fast failing, is improving, and better than it has been for years. I consider you the instrument in the hands of God of saving my life, and relieving me of the most direful disease that flesh is heir to. I could truly wish you might live forever to relieve suffering humanity. Accept my warmest thanks for your kind attention and success in my case, and with them the silver pitcher, which I request you to place in your office, as a grateful memento.—My residence is Lynchburg, Virginia, and will be glad to give to any person information in regard to your method of treatment and extraordinary success.

Yours, truly W. P. ALLISON, M. D.

It will be perceived that the gentleman who writes the above letter is himself a physician, and well qualified to judge of the merits of Doctor Gilbert's treatment. We can only advise our readers, and physicians particularly, to call at the doctor's rooms, No. 483 Broadway, and see for themselves the wonderful cures he is effecting.

Awards of our Prizes.

MESSRS. MUNN & Co.—Yours of Dec. 31st, 1853, came to hand, bearing the gratifying intelligence of my name being one of the lucky ones, in regard to the prizes offered by you for the largest lists of subscribers to the "Scientific American.

I will here take the liberty of saying, without intending to flatter, that I think some of our mechanics and manufacturers do not consult their own interests in not encouraging a journal like the "Scientific American," devoted as it is almost exclusively to the interests of the "Mechanic, Manufacturer, and Inventor." In this city there are some establishments where there are one hundred hands, and very few of them subscribe for your paper; but I would not have you think that all of our machine shops are of this character—there are some honorable exceptions.

As regards the $75 subject to my order, I would say that I expect to be in your city in April, and will then attend to the matter.

Respectfully yours, BENJ. RANKIN.

Louisvile, Ky., Jan. 14, 1854.

We are indebted to Hon. F. K. Zillicoffer, and Hon. W. H. Seward, for Congressional favors Mr. Zillicoffer having been *reduced* from the position of an Editor, to that of member of Congress, knows the value of Congressional pu b ications, to the Editorial profession.

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New Inventions.

Improved Turn-Table.

J. C. Robie, of Binghamton, N. Y., has invented an improvement in Turn-Tables for railroads, which consists in balancing the platform of the turn-table upon the revolving roller carriage which supports it, in such a manner that either end of the platform may be depressed to rest upon a bed or bearing provided for it while it is receiving or having discharged from it an engine and tender or any carriage. The turn-table is provided with eccentrics between the roller carriage and platform on opposite sides of the center, which are so arranged and can be so operated as to support the platform on a level previous to turning it, and to hold it firmly in that position, or to raise one side and depress the other upon its bearings. This is an excellent invention, and measures have been taken to secure a patent for it in the United States and Great Britain.

Improvement in Devices for Rail Cars.

D. A. Hopkins, of Elmira, N.Y., has invented several devices pertaining to Railroad Cars, on which he has applied for patents. The first of these relates to an improved ticket box for the reception of original tickets; the box being so arranged that the tickets cannot be abstracted therefrom. One of these is provided for every car seat, and the tickets are taken therefrom by agents at the end of the line. Another device relates to an improved journal box, and consists in the employment of elastic plates fitted within the oil box for the purpose of compensating for the wear of the bearing. Elastic collars are placed at the ends of the box to exclude dust. A third device consist in having an elastic plate in the inner side of the outer end piece of the box, against which the end of the journal bears.

Improvement in Railroad Tracks.

James Ingersoll, of Grafton, Ohio, has invented an improvement in Railroad Tracks, the object of which is to dispense with the use of frogs on those parts of rail tracks which are provided with switches. These frogs are uncertain in their action, and are liable to some other important objections. To effect the object mentioned, and also to secure a continuous track, a rail is employed, secured to a turning plate arranged between the switch and the rails of the tracks, this rail being so arranged that by means of elbow shifters and other devices connecting with the switch, it will, when the switch is moved in one direction, form a continuous way of the main track, and when changed, of the branch track.

Governor for Marine Engines.

James Rankin, of Detroit, Michigan, has invented an improved governor for marine engines, the nature of which consists in furnishing the steam pipe with a throttle valve connected with a float attached to the vessel near the paddle wheel or propeller, in such a way that when the greatest area of paddle board or propeller is submerged, the buoyancy of the float causes it to rise and open the valve, but that when the wheel rises from the water the float, descending by its own weight, will operate upon the valve so as to reduce the opening. A patent has been applied for.

Fastening Shoemakers' Tools to the Handles.

A. Vittaly & Carl Kolb, of Newark, N. J., have applied for a patent on an improved mode of securing Shoemakers' Tools to their handles, by means of which one handle only is required for several tools, as they may be changed by means of a peculiar arrangement of a screw rod, metallic shoulder, and dowel pin, on the employment of which devices is based the application for a patent.

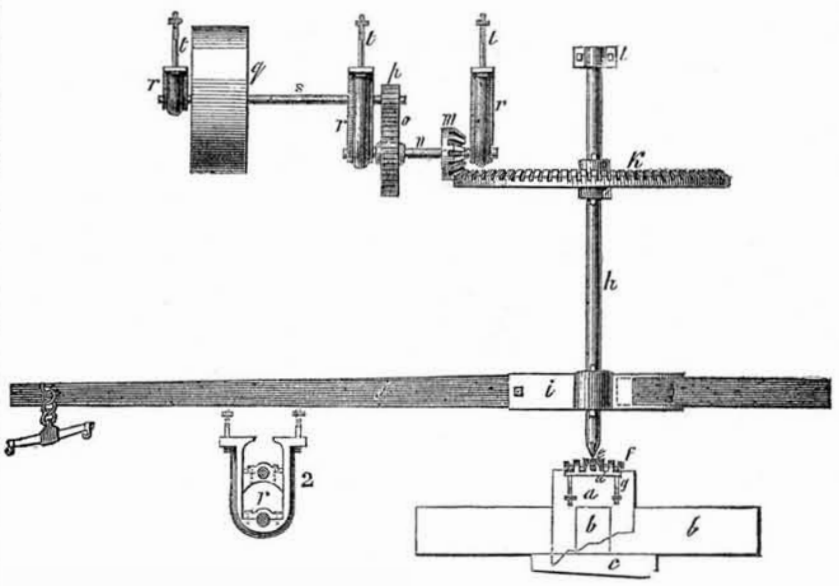
Setting Carriage Axles.

G. W. Fink, of Circleville, Ohio, has invented a new device for setting Carriage Axles, whereby the distance that the shoulders of different sized axles should set apart can be ascertained, and also the proper length, taper and set that should be given to the axes or journals, all of which can be ascertained in much less time than by the old method. The inventor has made application for a patent.

Feeding Printing Presses.

D. B. Hazelton, of Charleston, S. C., has made application for a patent upon an improved device for feeding paper to printing presses, the nature of which consists in having a cylinder provided internally with a series of longitudinal chambers, or recesses parellel with the axis of the cylinder. These chambers as the cylinder revolves communicate at certain points, with tubes leading from a fan or its equivalent, by which the air is alternately exhausted from and forced into the chambers. The periphery of the cylinder is perforated so that the chambers communicate with the external air, and the periphery of the cylinder as it rotates has an alternately attracting and repelling surface.

BOCAGE'S HORSE POWER.



We present herewith a stationary horse-power, intended especially for use on plantations, for driving cotton gins. The arrangement of the parts is quite ingenious. The engraving represents a front view.

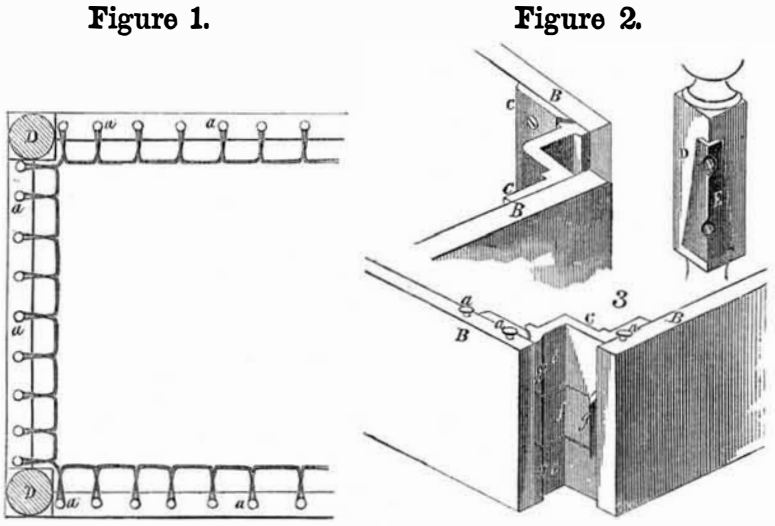
a is a piece of durable timber (eight inches square and six feet long); *b b* are cross timbers, crossed in mortices cut in *a*. *c* is the key securing the whole together, all of which is embedded in the ground for sustaining the main shaft, *h*. *d* is a cast-iron plate with four uprights, through which pass the screws, *f*; this plate is securely bolted to the timber, *a*. The screws, *f*, act on the step, *e*, the object of which is to keep the upright shaft, *h*, in a perpendicular position. *h* is the main shaft, pivoted upon the step, *e*. *l* is a metalic box securing the upper end of *h*. *i* is a cast-iron flange, secured upon the shaft with a key; the dotted lines show the socket into which the end of the lever is placed, *j* is one of the levers by which the machine is moved. On the left of the flange is shown the side which receives the pressure of the lever. *k* is a strong spur gear wheel having 125 teeth, an inch and a half pitch, keyed on the main shaft. *n* is a short shaft upon which are secured the pinion, *m*, having 17 teeth, and the counter wheel, *o*, spur gear with 45 teeth, 1¼ inch pitch. *s* is a shaft, the length of which is suited to the position of the stand, upon which are secured the pinion, *p*, having 14 teeth, and the belt pulley, *q*, which is cast heavy that it may have the effect of a fly-wheel. The two last shafts are supported in the three hangers or stirrups, *r*, which are secured to the gearing beams by the bolts, *t*. Figure 2 shows the hanger with the two journal boxes.

The advantages claimed for this horse-power are greater simplicity of construction and durability than those in common use. It has been quite extensively introduced upon the plantations. The arrangement for adjusting the step so as to keep the main shaft vertical, effectually obviates any undue strain from an inclination of the shaft. We can recommend it to the attention of planters and all others desirous of purchasing a cheap and convenient horse-power.

For any further information address J. W. Bocage, Cypress Mills, near Pine Bluff, Ark.

IMPROVEMENT IN BEDSTEADS.

Figure 1. Figure 2.



The engravings herewith presented are illustrations of an improvement in bedsteads, invented by W. E. Merrill, and F. Tupper, of Nashua N. H., on which a patent was obtained the thirteenth of December last. Fig. 1. is a portion of a plan or top view of the bedstead, showing the manner in which the canvass is attached to the rail. Fig. 2. is a section showing the device by which the rails are secured to the posts. Fig. 3. is intended further to illustrate the same device. Similar letters of reference indicate corresponding parts.

A represents a canvass bottom having a series of loops around its edges. B. B. B. represent the rails, having upon their upper surfaces a series of buttons, a a, which pass through loops on the canvass when it is secured to the rails. To the underside of the canvass, A, are attached a series of springs secured to the horizontal slats. These slats rest upon cleats which are secured to the head and foot rails of the bedstead. The slats are not attached to the cleats, but may rest upon them or in recesses cut in their upper edge.

To the ends of the rails, B, are attached corner irons, C, each one being bent in zigzag form, so as to make a recess for the reception of the post; this is seen in figs. 2 and 3. The iron on the end of the one rail, has two prongs or angular projections, *e e*, and the iron on the end of the adjoining rail is provided with one prong or projection, which fits between the prongs, *e e*. Each of them is provided with a small cleat, *g*, at the extreme end of the rail, and the post D, has a beveled clamp or dog E, which fits in the recess formed by the irons, *c*, and binds against the cleats, *g*, and thus the post and the rails are firmly secured together. By merely raising the rails, they may be detached from the posts. The claim is for the above described method of securing the rails and posts, together by means of the corner irons, and clamps. For any further information address the patentees.

Recent Foreign Inventions.

Steam Carriage Brake—J. Blair, of Manchester, Eng., patentee.—The inventor states the following as a mode in which his invention may be operated:—Under the foot-plate of a locomotive engine, and attached thereto by stays shall be affixed an ordinary steam cylinder with piston. Upon that end of the piston rod which projects through the cylinder cover shall be placed a broad flange or surface, similar in make to those now in use in railway carriages, called "buffers." The cylinder shall be placed in the center of the foot-plate, the piston rod projecting in the direction of the engine-tender. The engine-tender, and each and every carriage respectively, shall carry its own shafting and breaks; namely, the tender shall have underneath and lying along its center a shaft terminating at both ends of the tender with a broad flange or buffer. These buffers or flanges will project and lie at equal distances from the regular buffers now in use on railway tenders and carriages, and will have the appearance of a third buffer to each end of the tender. Attached to this shaft shall be strong arms or bars of wrought-iron, upon the ends of which will be the break-blocks, which will be placed on the carriages, only so far from the wheels of the tender as to allow the wheels to revolve without interruption. Each carriage shall also carry a similar shaft, terminating at each end of the carriage with flanges or buffers' and having also the appearance of a carriage with *three* buffers instead of two. Attached to the shaft under the carriage (in the same manner as already described to the tender-shaft) shall also be strong wrought-iron bars, with break-blocks on the end of each, and also lying close to the carriage wheels, but without interfering with their revolution. The shaft already mentioned shall work in sockets or steps, and shall move backwards and forwards, placing on and taking off, when necessary, the breaks to and from the wheels.

White Lead—George Carter, of Kent, and George Marriott, of Hull, Eng., patentees. The inventors take a quantity of fine ground oxyd of lead—litharge—and to every 100 lbs. thereof add about twenty-five pounds of the muriate of soda, which is mixed and triturated until the muriate of lead is formed. These materials are then well washed and 5 lbs. of the sulphuric acid of commerce is added to them in a glass vessel. This produces a white sulphate of lead in a few days. The vessel containing these ingredients should be kept in a moderately warm place, and when the sulphate is fully formed, it is washed well with cold water and dried. After this it is ground, and is fit for use as a paint.

Purifying Coal Gas and Disinfecting Sewerage Matters.—T. J. Dimsdale, of Dublin, Ireland, patentee.—Peat earth is used alone or is mixed with common earth, or the ashes of coals, and coal gas is passed over it; or the matters from sewers passed through it. This is stated to be a most excellent disinfectant of sewerage matters, and for purifying gas.

Another Method of Purifying Coal Gas—W. Chisholm, of London, patentee.—This invention consists in the purification of coal gases, by peats containing substances with which they are found associated in nature, and in obtaining the salts of ammonia from the peats which have been so used. These two patents are very similar in their nature, and almost amount to a confliction of claims.

[Collated from our foreign cotemporaries, the "Mechanics' Magazine," "Newton's Journal," "Artisan," and "Mining Journal," London; "Genie Industriel," "L'Invention," and "La Lumiere," Paris, and the "Glasgow Mechanics' Journal.]

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Scientific American.

NEW YORK, JANUARY 28, 1854.

The Caloric Ship "Ericsson."

To the Editor of the New York Express.

I have much pleasure in assuring you that there is not the slightest cause for the doubt you express in relation to this enterprise. The new engines are completed, and have been at work for several days, their operation proving conclusively that the practical difficulties which attended the first arrangement, have all been overcome. The new engines are much reduced in size, whilst their principle of action is the same as before, with this exception only, that condensed atmospheric air is employed in place of the ordinary atmospheric, for producing the motive power. This modification admits of an increase of power, limited only by the capability of retaining the pressure in the machine. Some difficulty has been experienced in this respect, and it is this which has caused some delay recently. The obstacle is, however, nearly removed, and the public will shortly have an opportunity of judging by practical evidence of the merits of the Caloric ship. I am, sir, very respectfully, your obedient servant,

J. ERICSSON.

New York, Jan. 12, 1854.

[Mr. Ericsson has at last made public confession that his former Hot-Air Engines were entire failures. This the public were told would be the case, through the "Scientific American," before the "Ericsson" ship made her trial trip. We based our opinions on the nature of the motive element—Hot Air. Our views have been verified in every particular. There are certain mechanical laws which are well known to all who are versed in the science of mechanics, such as "there is no power in a lever," it being a mere agent to transmit force; "action and re-action are equal," &c. But the question of hot air, as a motive agent and economical substitute for steam, is more intricate, and embraces a higher range of information. The chemistry of the atmosphere, the law of the expansion of air by heat—its action upon metals when highly heated, and the means employed to make it operative in the "Ericsson" must all be understood in order to pass judgment upon the "Hot-Air Engine." No new project in our day can compare with this in magnitude, for the testing of a dubious motive power, and none has excited so much attention. It has been a touch-stone to test the knowledge of many whose names have stood somewhat prominent as men of science—they were weighed in the balance and found wanting.

In the above letter, Mr. Ericsson informs the public that his *new engines* "are *much reduced* in size, which modification *admits* of an *increase of power*." This is indeed a strange doctrine to propagate now, and is the very antipodes of the one he so eloquently and so strongly enforced on board of the "Ericsson" when she made her trial trip down the New York Bay on the 11th of last January—one year and one day, exactly, from the time he penned the above letter to the "Express." The trip was made expressly for the Editors of the New York Press: and our brethren were in raptures at the success of the Hot Air Ship. Mr. Ericsson, from a diagram explained the construction of his engines, and highly extolled his large cylinders—they were grand features in that Caloric Engine's success. Let us quote his own words, given in answer to a question of Mr. Dana, of the "Tribune," or of Mr. Bigelow, of the "Evening Post," we forget which:—"If it is advisable," he said, "to obtain an augmentation of force, it is only necessary to *enlarge the cylinders*, and thus augment the power. *Were I* to build the engines anew, I would make the cylinders 16 feet diameter instead of 14 feet; and were we able to introduce cylinders of 20 feet, we would be able to surpass anything that floats upon the ocean, and the effect of the movement would be extraordinary."

How does this language accord with the above letter of Mr. Ericsson? A year ago he was to augment the power of his engines, by increasing the size of his cylinders, now he has augmented their power by decreasing them (from 14 feet diameter to 5 feet). The language of Mr. Ericsson we have quoted from the "New York Daily Times" of the 12th Jan., 1853—the above letter is dated 12th January, 1854. Oh, Mr. Ericsson, what a descent you have made in one year! Then you were to gain power by going up, now you have gained it by coming down.

Mr. Raymond, Editor of the "Times," in his editorial remarks, said—"Many persons, whose interests will be seriously affected by the introduction of this new agent, will be reluctant to believe in its feasibility, distrustful of evidence, and obstinate in belief, but they cannot alter the *fact*. And they will most effectually protect their interests and reputation by adjusting them to the new Power and the changes it must effect; caloric ships will very soon take larger cargoes with lower rates of insurance than steamers." Mr. Raymond also lectured, a short time afterwards, on the peculiar superiority of the Hot-Air Engine; the information of his lecture was culled for him—he was merely its endorser, and was no doubt sincere in his opinions, but mistaken.

The "New York Tribune," of the same date as the "Times," made use of the following language:—

"The demonstration is perfect. The age of steam is closed, the age of caloric opens. Fulton and Watt belong to the Past—Ericsson is the great mechanical genius of the Present and the Future."

All the papers in our city were nearly as loud in their praises, and as decided in their views of the success of the Ericsson, as the two whose language we have quoted. These representatives of the Press do very well in expressing opinions upon matters that are not scientific: when they touch such questions they get beyond their depth, as the sequel has shown.

So infatuated were the proprietors of the N. Y. "Evening Post," with the "Ericsson," that in an article on the 29th Jan., 1853, it was stated, "they had contracted with Capt. Ericsson for a Hot-Air Engine." One was made to fill the order, but just as it was ready to be put in, it was discovered, that it had to be sent to France to secure Mr. Ericsson's patent there. A new one was to be ready in the month of last September, 1853, but is not ready yet. Probably it was built with too large a cylinder, and it may be taking its turn to get in a smaller one in order to *augment its power*. Well, wonders will never cease.

But then there is a false impression conveyed to the uninitiated in the above letter. It is stated that the small new engines are to augment their power by using *condensed air*. The old large engines condensed the air from atmospheric pressure to 12 lbs. on the square inch. No gain of power can be obtained from condensing the air; it takes as much power to condense the air, as can be obtained from it afterwards. The use of highly condensed air also is not new. See page 559, Vol. 45, 'London Mech. Mag." in the description of Stirling's Air Engine. The only way to economise hot air would be to use it at a high heat, but as this cannot be done, it is all nonsense to attempt the use of it at all.

We have been informed that the *Regenerator*—that wonderful magic contrivance of Ericsson—is not to be used in the new engines. Everything about their construction, however, is kept so mysteriously secret, that persons are not allowed to visit them for fear, we suppose, they might swallow the condenser and run off with the air pumps. This subject will necessarily demand from us more attention, but we have said enough for the present.

Cheap Ocean Postage.

Meetings have been held in all our principal cities for the purpose of exerting an influence upon our government to adopt a system of Cheap Ocean Postage. Elihu Burritt, the learned blacksmith, is the author and active agent in this Postage Reform. He is devoting his life and labors to it, and *Peace Measures*. The object is a universal system of Ocean Penny Postage, leaving the inland postage the same as it is at present. Thus for a letter to England, this reform would reduce the price to the person who receives it—post-paid here—to one penny (two cents). And to a person who receives a letter from England, the price would be three cents instead of 24, as it is at present. This sytem would save much trouble in our Post Office, and be of great benefit to our people. We hope the time is not far distant when it will be carried out. Of course this can only be done by a treaty between our Government and that of England, and other countries, such as France, with which we maintain ocean communication.

Law of Freezing Water---Beautiful Adjustment.

There are many well-known laws of matter, which have the appearance of being divinely provided for the benefit of man. Thus, by a very peculiar law, contrary, as it were, to a general law, the rivers and fountains in our climate are prevented from freezing to any very great depth. The effect of heat upon bodies is to expand, and cold to contract them. If this law was constant in its operations, in respect to water, ice would commence to form at the bottom of lakes, rivers, and brooks, then they would rapidly freeze upwards and destroy every living thing therein. This is provided against by a peculiar law. The water of our rivers and lakes, above 40 degrees, Fahr. when exposed to a greater degree of cold, cools rapidly at its surface, which surface water is condensed and sinks. This process of surface cooling and sinking goes on rapidly until the whole water has been cooled to 40°, which is 8 degrees above the freezing point. Below this temperature the chilled surface of the water, instead of condensing into less bulk, actually expands (becomes lighter) and remains at the surface, and the cold is thus very imperfectly propagated downwards. The surface in the end freezes, and the ice may thicken, but at the depth of a few feet below the temperature is not under 40°, which is indeed high when compared with that which we frequently experience in our atmosphere during winter. If water, in cooling below 40°, obeyed the same law which it does in cooling to that point, our rivers, streams, and lakes, would become masses of ice, upon which our warm summers would make but little impression, and the cheerful climate which we now enjoy would be less comfortable than the frozen regions of the poles. Upon such delicate and beautiful adjustments do the order and harmony of the Universe depend.

The San Francisco.

The fate of this unfortunate steamship is now well known to all our people, but the accounts which have been published respecting the causes that led to her *foundering* at sea, are not a little contradictory. In our opinion those causes were three-fold—1st. She was too deeply loaded, and would not answer the helm; 2nd. she was built with side guards, and these prevented her from steering well, and at the same time served as levers for the mighty waves, to lift her up and strain every part of the hull; the third was, defective engines. They were oscillating, but said to be of good workmanship,—and yet letters have been published wherein it is asserted they did not operate well on the trial trip. The *condenser* is stated to have been defective and was almost useless from the very first. How true this is we do not know, but the report is general. Her paddle-wheels were Morgan's "feathering kind,"—that is, the floats were operated by the machinery, and made to enter and leave the water vertically. It is a surprising thing to us that such wheels were put into the vessel, as they have been condemned by the West India Mail Co., they having been taken out of three of their steamers, and their places supplied with the common radial kind, by which an increase af speed was obtained; thus showing that the old kind was the best in point of efficiency.

We may be mistaken, but to us it appears evident that there was great mismanagement displayed in sending a vessel in her condition to sea. In the trying hours of danger all on board appear to have done their duty, and no fault, we believe, has been found with a single officer. The cholera broke out in a very aggravated form among the families of the private soldiers, owing to their close confinement, by which the air became perfectly poisonous. It was reported at first that the disease was caused by a too free indulgence in pickled meat, but the physician of the vessel has flatly contradicted this report, and attributes it to the cause mentioned—over-crowding in a confined space.

The merchants of our city have been raising a fund to reward the Captains of the "Three Bells," "Antartic," and "Kilby," who acted in so praiseworthy a manner in rescuing the exhausted sufferers. We hope the government will show some proper feeling on the subject; resolutions have been introduced into Congress for the purpose of presenting some testimonial of esteem to these brave men. May they not end as too many such resolutions do—in mere words.

Purifying Fish Oils without Heat.

Take a gallon of crude fetid fish oil, and add to it one ounce of powdered chalk, and stir them well together. After they have been mixed for some hours, or a whole day; add one ounce of pearlashes dissolved in four ounces of water, and repeat the stirring as before. After the oil has been thus treated for some hours, add two ounces of common salt dissolved in a pint of water, and stir well. When left standing still for some days a deposit will be found at the bottom of the vessel. This contains many impurities that have been separated from the oil, which will be found to be much improved both in smell and color.

Repeating the same process several times, taking care to pour off the clear oil before every renewal of the chalk, &c., any oil, however fetid, and however dark in color, will be rendered free from offensive smell, and of a good color.

Sal soda, dissolved in water, about one ounce to the gallon, and stirred among impure and rancid oil, will render it very free from smell and greatly improve its color. The oil should be put on the fire in a brass or iron kettle (of any size according to the quantity to be purified) and the soda lye added when the oil has attained to about 190° Fah. The whole should be stirred together for at least half an hour, and the scum skimmed off as it rises. After this draw the fire from under the kettle, and let it cool and settle. A thick sediment will then fall to the bottom, and when fully settled, the oil may be drawn off, which will be found very greatly improved indeed. This is an excellent way to purify oil that is to be used for the lubrication of fine machinery.

Rancid oils are rendered sweet and clear by agitating them for some days with new charcoal reduced to a powdered state.

Uniformity of Weights and Measures.

We have already directed the attention of our readers to the benefits that would result from the adoption of a decimal system of weights and measures for our whole country. France is in advance of all nations in this respect, so far as it relates to weights and measures, while *our* currency is superior to that of all other nations. In the calculations of angles, we use the sexagesimal division, while modern French mathematicians use the centesimal. In our currency we show good sense; in mensuration, nonsense. We understand that this subject occupied part of the deliberations of the American Association for the Advancement of Science in 1851, but since then we have heard nothing from that Body on the topic. The Smithsonian Institute should evoke the influence of Congress in advancing the interests of our country by adopting the French system, which cannot be improved. Let us use every sensible system, let it come from what quarter it may—anything to benefit our people.

Application of Chloroform.

A corresponding physician of "Nelson's American Lancet," states that he has applied chloroform successfully in cases of Neuralgia, Tic Douloureux, Tetanus, &c. In a case of Tetanus he applied lint saturated with chloroform along the whole spine, and covered it with india rubber cloth; this was attended with the best results. In cases of toothache, he had found a remedy in filling the cavity with cotton saturated with chloroform, and renewing it until the sensibility of the nerve was touched.

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Calicoes—This is the name of printed cotton cloth. The art of producing a colored pattern on cloth by the application of coloring substances, appears to be ef great antiquity. Homer notices the variegated linen cloths of Sidon, and ancient historians speak of the inhabitants of Caucasus adorning their garments by means of an infusion of the leaves of a tree, and that their colors were permanent. All nations, savage and civilized, have a passion for personal adornment; and nations, too savage to manufacture such clothing, make up for their want of manufacturing art, by tatooing or painting their bodies. It is a little humilitating to those of our own race, "who boast of their ancestry," to be told that their forefathers roamed through the forests of Albion and Caledon, adorned with all the glorious paraphernalia of calico painted bodies, for want of calico-printed clothes. The ancient Britons painted their bodies with the figures of the sun, moon, stars, animals, &c., and looked as fierce-like in battle as the painted Braves of the Blackfeet or Mandan Indians. Since that time we have borrowed and learned from nations which *we*, the descendants of such progenitors, now call "barbarians." The modern inhabitants of Egypt are dark and benighted and not a yard of printed cloth is made in that country, yet the ancient Egyptians practiced the art when some of our progenitors lived in caves, and wandered about in deer and wolf-skin clothing.

Pliny says of the Egyptians—"They take white cloths and apply to them, not colors, but certain drugs, which have the power of drinking in or absorbing color, and in the cloth so operated on, there is not the slightest appearance of any dye or tincture. These cloths are then put into a cauldron of coloring matter, scalding hot, und after having remained some time therein, are withdrawn all stained and painted in various colors. This is indeed a wonderful process, seeing that there is in the said cauldron, only one kind of coloring matter, yet from it the cloth acquires this and that color, and the boiling liquor itself also changes according to the quality and nature of the dye-absorbing drugs, which were first laid on the white cloth. And these stains or colors are firmly fixed. It is strange that one liquor should thus give a variety of colors." This shows that the ancient Egyptians were well acquainted with what is now termed "Brittan printing."

In India the art of calico printing has been practiced for ages, and it derives its English name from *Calicut*, a town in the province of Malabar, where it was formerly carried on extensively. The large cotton chintz counterpanes, named *palampoors*, which, from an early period have been made in the East Indies, are prepared by placing on the cloth a pattern of wax, and dyeing the parts not so protected. When Mexico was first discovered, the inhabitants wore cotton cloth stained with various colors, but these colors were merely painted or dyed, not printed.

The art of calico printing was practiced in Asia Minor for several centuries before it was introduced into Europe. It was not until about the close of the 17th century that Augsburg, in Germany, became famous for its printed cottons and linens, and that city was a school for many years for the manufacturers of Alsace and Switzerland. The art was introduced into England, in 1676, by a Frenchman, who established works near London, on the river Thames. In 1712 the British Government imposed a duty of 3d (6 cents.) per yard on printed calico, and two years afterwards doubled it, and then two years after that, at the earnest clamors of the silk and woolen weavers—powerful bodies of men, whose trades were injured by the increased consumption of calico—a disgraceful act was passed, prohibiting the wearing of all calico, under a penalty of £5 (about $25) for each offence on the part of the wearer, and £20 on the seller. In consequence of this barbarous law against the free rise, progress, and practice of this art in England, the calico printers operations were confined entirely, until 1730, to printing linen. In that year cloth, with a warp of linen and weft of cotton, was allowed to be printed, subject to a duty of 6d. per yard. With such impediments, no wonder the progress of the art in that country was very slow. In 1753, only 50,000 pieces, of about 35 yards long, of the mixed linen and cotton cloth, were printed in all Britain; in 1853, one single printworks in Manchester turned out 400,000 pieces of calico. What a change in the progress of this art; it is one of the mile-stones of trade set up on the highway of the arts. In 1774, an act was passed repealing the former one of 1753, and allowing cloth to be woven and worn composed wholly of cotton, but subject to a duty of 3d. per yard.

This duty was only imposed on the calico consumed in Britain (not Ireland) and no duty was collected on calicoes exported to America, or any other country out of the United Kingdown. In 1830 a revenue of no less than about $11,400,000 was levied on British-made calicoes—one of the direct taxes upon the people. At that time, we believe, there was no calico printwork in the United States (so far as we have been able to learn.)

This subject will be continued at some length in future numbers of the "Scientific American."

Reports of the Crystal Palace Juries.

The Juries selected to examine into the mer its of the machines, articles of manufacture, and works of art, and award medals for those possessing superior merit, have made their Reports. The number of Prizes is so great that we cannot publish the list with the names of the persons who obtained them, there being no less than 115 silver and 1,186 bronze medals awarded. We will only present those, at present, which have been illustrated in our columns:—

Silver Medals—George W. Beardslee, Albany, N. Y., machine for planing and matching boards.

L. S. Chichester, Brooklyn, N.Y., hemp and flax machine.

Gwynne & Sheffield, Urbana, Ohio, stave making machinery.

C. B. Hutchinson & Co., of Syracuse, N. Y., stave machinery.

Wells & Hills, Milwaukee, Wis., for Hawkins' stave-dressing machinery.

Joseph Greely, Nashua, N. H., for Eastman's patent stone dressing machine.

James T. Ames, Chicopee, Mass., Eccle's gingham loom [an engraving of this loom will appear in our next number.]

Prof. Morse, for his Telegraph.

Jearum Atkins, Chicago, Illinois, for his automaton reaper and raker.

Slater & Steele, Jersey City, N. J.; spice weighing and packing machine.

Bronze Medals.—Adams & Son, Amherst, Mass., felly machine.

Jearum Atkins, Chicago, Ill., automatic mechanical device.

Nelson Barlow, New York City, wood planing machine.

Messrs. Buck, Lebanon, N. H., Daniel's planing machine.

David Dick, Meadville, Pa., anti-friction press, punch, and metal shears.

A. C. Gallahue, of Pittsburg, Pa., shoe pegging machine.

Charles F. Mann, of Troy, N. Y., portable steam engine.

Alfred A. Parker, St. Louis, Mo., tobacco plug pressing machine.

I. M. Singer, New York City, for sewing machine.

Union Power Company, New York City, Gwynne's centrifugal pump.

Wheeler, Wilson & Co., 265 Broadway, N.Y., sewing machine.

W. Crosskill, of Hull, Eng., Archimedean potatoe washing machine.

C. H. McCormick, of Chicago, Ill., for reaping machine.

Smith & Fenwick, New York, for apple paring and coring machine.

C. Sharp, Hartford, Conn., breech-loading rifle.

Massachusetts Shovel Co.. Worcester, Mass., Kimball's patent shovel.

J. B. Tillinghast, Point Harmer, Ohio, centrifugal churn.

A. C. Carey, New York City, Rotary Pump.

G. A. Gardiner, New York City, a power drilling machine.

Otis & Cottle, Syracuse, N. Y., power mortising machine.

J. M. Bottom, of Bridgeport, Conn., watchmaker's lathes.

Foster & Bros. Cincinnati, Ohio, hand printing press.

J. Gibson, of Albany, N. Y., Woodworth's machine.

Harris & Son, Elizabethtown, N. J., smut machine.

J. Laidlaw, Jr., New York City, wet gas meter.

Joshua Woodward, Haverhill, N. H., corn and seed planter.

J. A. Ross, St. Louis, Mo., Miller's sewing machine.

The silver medal for Steam Engines was awarded to the "SouthernBelle," J. S. Winter, Montgomery, Ala.

A silver medal was also awarded to the Architects of the Palace, Messrs. Carstensen and Gildermeister. Also one to Gail Borden, Jr., for his Meat Biscuit; one to B. F. Palmer, of Philadelphia, for his Artificial Leg, and one to J. A. Whipple, of Boston, for beautiful Crystallotypes.

Cotton in the United States.

Messrs. Editors—A friend noticing some allusion in one of the late numbers of the "Scientific American, to the subject of cotton, has requested me to send you the following statement. The compiler of these statistics was for many years connected with the Custom House in this city, and has abundant facilities to insure correctness, while his great interest in such matters has led him to keep them up for a number of years:—

From 1826 to 1835 (10 years), cotton used per year, 425,000,000 lbs.

From 1836 to 1845 (10 years) there was used per year 801,000,000.

Of every 100 bales England receives 57, France 17, Holland and the North 6½, Trieste and the South 6½, the United States 13.

Of the amount exported from the United States seventy-hundredths goes to England.

Of the whole amount raised (or made) in the United States, for 1853, fully twenty-two-hundredths of every bale are consumed in this country. C. W. Felt.

Salem, Mass., Jan. 16th, 1854.

Foreign Scientific Memoranda.

Chinese Grass.—The rheea fibre, or the true Chinese grass, is already cultivated by the natives of Assam to make fishing lines and nets. Its shoots can be cut down several times a-year, and its fibers they know how to separate. Major Hannay has been able to improve the process by the assistance of the Chinese in Assam. Captain Thompson of the house of Thompson & Co., ropemakers, of Calcutta, found the rheea fibre from Rungpore to be three times stronger than the Russian hemp, and the wild rheea everything that could be desired for ropemaking, though the cultivated kind, probably from a difference in the preparation, he thought a little too rigid for the running rigging of ships. But as there is no doubt of the strength and flexibility of their fibres, it is to be hoped that they will, when more generally known, be more extensively employed for rope-making, especially as they can be produced at a price under that of Russian hemp.

New Locomotive—The Stuttgart journals give the following details of the locomotive which has just been constructed at Esslington (Wurtemberg), for the Mont Soemmering railway in Austria:—"This locomotive, which is called the Kappelen, has ten wheels; its boiler is twice as large as that of the ordinary engines; the tender is not separate, but forms an integral part of the engine, It is in the form of a horsehoe, and advances on each side or the boiler.

Huge Zoological Remains—A discovery of great interest to the science of paleontology has lately been made at the gates of Constantina (Algeria), while making a cutting for the improvement of the approaches to that city, where a great part of the skeleton of some gigantic animal was found. The thigh and leg bones, the vertebræ, the ribs, the upper part of the head, and several teeth were in a very good state of preservation. The head is not less than 85 centimetres from the teeth to the nape, and 48 across the bone of the forehead. The front part of the upper jaw has long teeth, and also tusks similar to those of a wild boar. The legs of the animal are about the size of those of a horse, and, from the bend of the ribs, it is supposed that its size must have been about four times that of an ordinary ox. Its head is somewhat similar to that of the hippopotamus, and its mouth must have been of extraordinary power. No name can be assigned to this animal, but it is considered probable that it may belong to the numerous family of antediluvian pachydermes. The ground wherein it was found is composed of a soft calcareous rock of tertiary formation.

Effect of Snow upon the Eyes—In an account by Jacques Balmot, of the effects produced on the eyes by the glare of the snow, when he and Dr. Paccord were ascending Mont Blanca, they had not the green veils on them which had been recommended, and he states that when he arrived at the grand plateau, he was so dazzled that he was nearly blind, and whichever way he looked he only saw big drops of blood. He sat down and closed his eyes for half an hour, and was then able to go on. They passed the night in the snow. On the following morning Dr. Paccorn exclaimed, "I hear the birds singing, and it is quite dark;" but his eyes were open, and he was blind for the time, and only recovered after careful management for a considerable period.

Eyelashes—In Circassia, Georgia, Persia, and India, one of the mother's earliest cares is to promote the growth of her children's eyelashes, by tipping and removing the fine gossamer like points with a pair of scissors, when they are asleep. By repeating this every month or six weeks, they become, in time, long, close, finely curved, and of a silky gloss. The practice never fails to produce the desired effect, and it is particularly useful when, owing to inflammation of the eyes, the lashes have been thinned or stunted.

Wall of China—In a lecture on China, which he delivered at Bolton, recently, Dr Brownrig said it had been calculated that if all the bricks, stones, and masonry of Great Britain were gathered together, they would not be able to furnish materials enough for the Wall of China; and that all the buildings in London put together would not make the towers and turrets which adorn it.

Adulteration of Drugs and Medicines.

At the commencement of the present session of Congress, a report from the U. S. Surgeon General was presented, from which it appears that the adulteration of drugs and medicines is carried on more extensively in the country since the passage of the act of Congress to suppress the importation of such articles, so that it is now alleged to be difficult to procure medicines which are not either mixed with some foreign substance, or from which some portion of the active principal has not been subtracted by chemical process. Thus it would seem that the effort to suppress the foreign trade has resulted in imparting an extraordinary stimulus to the home manufacture of the spurious commodities.

The Mackerel Fisheries.

By the returns of the deputy inspectors of mackerel in Massachusetts, for the year 1853, we learn that the catch by fishermen from that State has fallen off nearly one-third from 1852. Provincetown and Truro seem to have nearly withdrawn from the business, and Yarmouth and Chatham have done much less than formerly. In most of the towns where there is an increase of tonnage, there is a falling off of returns.—We are sorry for this, as mackerel is getting very high in price. We go for the annexation of the Bay of Fundy and the Gulph of St. Lawrence.

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TO CORRESPONDENTS.

R. T., of Mass.—We do not see how your proposed regulatorcan operate correctly.

G. W. K. of Ill.—We do not think your horse power possesses novelty sufficient to justify an application for a patent. We have seen horse powers constructed in substantially the same manner. We advise you not to apply.

J. G. E, of Ct,—Several patents now exists on weather strips. We cannot describe them all. Send sketch of yours for examination and we can soon tell you in regard to its novelty. The hay cutter which you describe is tho same as Macombers' illustrated in vol. 5 Sci. Am.

G. C., of Me.—We did not recollect your suggestion about operating the shuttle, but we now do. You were undoubtedly the first inventor.

C. A., of Pa.—Yourbellows for regulating the speed of engines may operate very well, but we cannot see any advantage you can obtain by it over the common governor—we would prefer the latter.

J. M., of Ill.—Agitate your oil for some time with good fresh ground charcoal, then let it settle, and you will find it rendered clear and beautiful. The quantity we cannot give: you can try a few experiments.

C., of Texas—The idea about the glass cylinder is a good one, but we have seen glass pump cylinders employed many years ago: common glass syringes are just portable force pumps without valves. No. 39. Vol. 9, is the end of your term.

A. J. S., of Pa.—Paint your twilled muslin with boiled linsed oil, and let every coat be thoroughly dry before you put on a new one. Boil about one ounce of the sulphate of zinc with every gallon of oil. Be careful in the boiling.

P. H., of Mass.—The patent, when extended, is understood to be for the benefit of the inventor. The assignees may procure its extension in case the inventor is dead, and they have failed to obtain adequate remuneration from its use.

J. A., of Ohio—It will make no difference with the case—you need not withdraw it until you have time to investigate.

E. L., of N. Y.—The cement patent has not been issued, but an application is in the office. We cannot communicate to you the manner of its preparation, it would be a breach of confidence to do so.

S. M., of Ill.—There is nothing patentable in your apparatus for hoisting; similar devices have been employed for the same purpose.

J. B., of Mass.—The Letters Patent for your invention were sent to Providence by writing to the P. M., he will forward them to your address.

T. C., of Pa.—The device which you describe forlighting street lamps is similar to one commonly used here in dwellings for lighting up gas chandeliers: we think it has no patentable feature.

D. H. S., of Ct.—Before purchasing a rifle you should try the three named: we have one of Sharp's, which is good; Marston's, for a breech-loading gun has no superior that we know of.

J. H., of Ill.—Why not buy a blow-pipe at once. You can find a description of the blow-pipe in Kane's Chemistry. Use alcohol, or if your city is lighted with gas, use the common gas pipe covered with wire gauze; the common blow-pipe must be employed.

T. S. W., of Mass.—Melt the lead first, then add the zinc, and stir well until it is melted; but it is very difficult to make them combine perfectly.

A. P, H., of N. Y.—You can get no patent on making water wheels in separate pieces, rendering them portable, because such a principle is neither patentable nor new.

H. B. P. W., of N. Y,—Such a spring can certainly be made—yes, one twice as powerful.

W. W. H., of Phila.—For certain reasons we are considering the matter more fully.

A. H., of Pa.—We have complied with your request.

J. C., of Geo.—How do you expect to obtain a sufficient supply of electricity by conductors from the earth; the current acts to restore equilibrium. We do not see either how you can operate the crank by the connection of the cylinder at 4 points—the one will operate against the other. There is no necessity for such an arrangement.

W. G., of N. Y.—We do not know of two liquids possessing the qualities desired by you. We do not believe your brass ball will explode, if it is perfectly sound, but we would be cautious with the experiment.

J. B. C., of Ind.—The difference which you describe between your own and Mr. S.'s invention we do not regard as patentable.

M. H. R., of Mass.—Address your inquiry to Messrs. Wells & Webb', of this city, they are very extensively engaged in the supply of printers' materials.

J. B. U., Jr., of N. H.—In Vol. 7 we published an engraving of Page's Electric Engine. We have also published others, and as nothing new has lately appeared in this line we shall be unable to comply with your request: you had better examine Vol. 7.

S. H., of Pa.—We do not think you could procure a patent for the application of a new material for lining stoves instead of fire brick or soap stone.

H. P. Co., of Ct.—The two inventors should join together and file in papers signed by each. In filing a caveat a drawing and specification are necessary, no model being required.

W. M., of Miss.—Your inquiry about the boiler has been directed to Messrs. Stillman, Allen & Co. for attention, they are New York Agents.

W. E. D., of N. J.—By reference to Vol. 5, Sci. Am., you will find in the "History of Propellers and Steam Navigation," a propeller almost precisely like yours. It is an old and well known contrivance and long since abandoned.

D. S. O., of Miss.—The washing apparatus referred to is made by King & Co., of this city; we will send your letter to them for attention.

A. H., of ——.—If you had given us your residence we should have written you in regard to the oscillating blowing machine. It is constructed different from any other we have ever seen, and we think you can procure a patent for it. Send us a small model.

T. S., of N. Y.—More than ten years ago we saw a carriage having wheels with wire spokes; there is no patent on it—they have been used considerably.

G. M., Jr., of Ill.—Flexible or india rubber tubes are and have been in use for many years for conveying sound; they cannot be used for extensive distances, hence the superiority of the telegraph.

W. S., Jr., of Ohio—A disc for planing boards has long been known. Bramah was the first who made use of it

J. B. B., of Ill.—The best work on high pressure engines is that of Kinnear Clark on Locomotives, which is the prince of high pressure engines. It may be, however, that you desire one which contains full and particular information on the "Mississippi Engines,"—we are sorry that we cannot refer you to such a work.

J. S., of Ky.—Give us a short analysis of the operations of the Parker Wheel, showing why it does outrun the velocity of the water. The experiments to which you refer as published, may not have been properly conducted.

W. R. M. F., of Tenn.—The center of motion on a wheel is the axis, but that is not the center of the wheel's path. It is not true about Washington ever having been in London—he never was in England.

J. C., of N. J.—Yours has been received, but is not up to the point, for if platina is employed as a substitute for copper for the negative pole, both oxygen and hydrogen are evolved. There is some evidence of oxygen giving out the electricity but not the hydrogen.

S. G. B., of Ohio.—The difference which you speak of, between the balls, is that the loadstone will not revolve the ball up an inclined plane of glass.

O. W. R., of Md.—The more hydrogen there is in any fluid, the more heat will be evolved by its combustion. Bituminous coal is just as good as anthracite, if the furnace is constructed in a proper manner for burning them. The great fault with furnaces employed for burning bituminous coal is, "they allow so much of the unconsumed products to pass out of the smoke pipe.

G. W. J., of La.—The manufacture of sugar has not yet attained to perfection: there is still room for improvement, and we hope you are in the fair way of accomplishing the object you so much desire.

Money received on account of Patent Office business for the week ending Saturday, Jan. 21:—

S. P., of N. Y., $50; C. C., of N. Y., $125: J. H., of N. Y., $35: O. B., of Ind., $10; L. & L., of Iowa, $30: J. I., of Ohio, $25; S. B., of Ct., $45; G. M. R., of Md., $10; S. H., of N. Y., $50; W. C, of N. Y., $10; D. B. H., of S. C., $10: D. S., of Pa. $50; J, C. R., of N. Y., $40; A. S., of O. $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 21:—

S. & C., of R. I.; D. A. H., of N. Y.; G. M. C., of N. Y.; L. & R., of N. Y.; R. & S., of N. Y.: J. Y., of Ohio; J. I., of Ohio; S. B., of Ct.; G. M. R., of Md.; D. S., of Pa.: G. W. S., of ——.

A Chapter of Suggestions, &c

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Scientific Museum.

On the Probable Depth of the Ocean of the European Chalk Deposits.

Various geologists, and among them Prof. Forbes, in his excellent and learned Palæontology of the British Isles in Johnston's physical Atlas, have suggested that the ocean of the chalk deposits of Europe was a deep one; and in evidence of this, Prof. Forbes cites the "striking relationship existing to deep sea forms of the English chalk corals and brachiopods, adding that the peculiar echinoderms, (Holaster, galerites, ananchytes, Cidaris, Brissus, and Goniaster) favor this notion, as also the presence of numerous foraminifera.

I beg leave, says Prof. H. D. Rogers, in the proceedings of the Boston Society of Natural History for 1853, to present a difficulty in the way of this conclusion. Several of this genera of echinoderms, as ananchytes, Cidaris, &c., occur in the green sand deposit of New Jersey, referable by every fossil test to the age of the green sand and chalk of Europe. And this American stratum was unquestionably the sediment of quite shallow littoral waters. That they must have had a trivial depth is proved by the circumstance that they repose in an almost horizontal stratification, at a level of not more than from one hundred to two hundred feet lower than the general surface of the hills and upland region to the N. W. of the margin of the zone they occupy as their outcrop. It is obvious that a depression of the cretaceous region, such as would cover the present deposits with a deep sea, would have likewise overspread the low gneissic hills to the N. W. of the Delaware, which present no traces of having ever been submerged during the cretaceous or any secondary period.

Mr. Ayres remarked, that of those genera of echinoderms, which Mr. Forbes regarded as deep sea genera, two or three are found in North America in water not two hundred feet deep. Terebratula, which has been generally regarded as only an inhabitant of very deep water, and whose structure has been described as admirably adapted to the depth at which it has been found, and which Prof. Owen has demonstrated cannot exist at a depth of less than two or three hundred fathoms, exists at Eastport, Me., in water so shallow that it can be taken by hand. In the same locality and position, radiata are found which have heretofore been thought to be only inhabitants of deep water. Some of Mr. Forbes' genera are also found in less than ten fathoms of water.

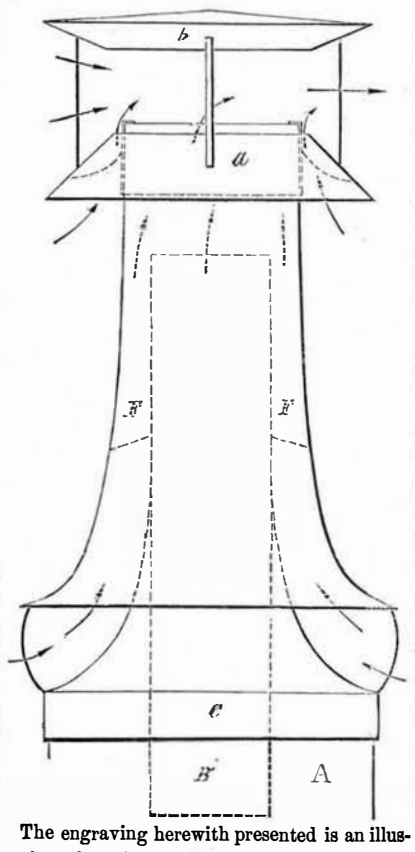
Papyri at Herculaneum.

They were first discovered in 1753, and are now deposited in the Museo Borbonico. Being rolled up in scrolls, they have the appearance of pieces of charcoal; and being piled up, it was only by accident that attention was directed to them, when Latin and Greek characters were seen upon them. They are found reduced to a scorched state, not more substantial than tinder. The difficulty of unrolling them has been overcome by attaching to the back some gold-beater's skin, by a strong gum (as recommended by Sir H. Davy). A small portion of this (when fixed) is then gradually unrolled by hands attached to it, the scroll resting in a semi-cylindrical trough lined with cotton. The process can only go on at the rate of about one inch per day. Several volumes have been restored and published; they appear to be chiefly works of epicurean philosophy. On the authority of one of them the "Economies of Aristole" is decidedly ascribed to Theophrastus.—The majority are Greek. One contains a review of the Iliad, in which the heroes of Homer are considered as all allegorical. The Latin works are on a differently prepared and thicker papyrus. The name of the author never occurs till the end; hence the impossibility of ascertaining what they are until completely unrolled.

To Prepare Pure Caustic Potash.

Wohler has given a simple method of preparing caustic potash in a state of chemical purity. One part of pure saltpeter in powder is to be mixed with from two to three parts of metallic copper cut into small pieces, and the whole heated to a moderate red heat for half an hour in a copper crucible. After cooling, the mass is to be treated with water, and the resulting lye poured into a narrow cylinder, which is then to be carefully closed. After the oxyde of copper has completely settled, the supernatant liquor may be drawn off with a syphon, and will contain no traces of copper.

Leeds' Patent Ventilator.

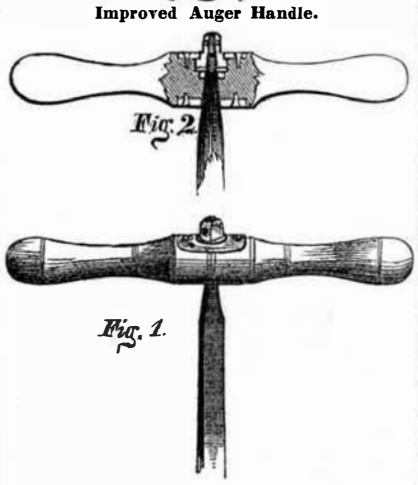


The engraving herewith presented is an illustration of an improvement in Ventilators, by Joseph Leeds, of Philadelphia. The power of draught in this ventilation is derived from two sources. One is the upward current caused by the expansion of the air in the chamber, F, surrounding the inner flue, C, the lower part of which, B, is inserted in the chimney, A. The additional draught is caused by the partial vacuum produced by the deflection of the current of air rising through the cap or deflector, *a*, assisted somewhat in its action by the upper cap, *b*.

The inventor is sanguine of success, and says that it has proved itself efficient whenever tried. He offers to warrant a draught to any chimney on which it may be placed, or to insure thorough ventilation to any room or vessel without admitting rain or snow. There are two patents on this invention, granted August, 1852, and Nov., 1853.

Applications for rights or ventilators may be made to Gilman Davis, State street, Boston, or Jos. Leeds, the inventor, No. 50 South 4th st., Philadelphia.

Improved Auger Handle.



The annexed engravings are intended to illustrate an improved Auger Handle, invented by W. N. Clark, of Chester, Conn., figure 1 being a side view, and fig. 2 a sectional view of the invention. Its object, as will be readily seen, is to furnish a single handle that may be adapted to a set of augers, and this is accomplished as in the common way by a screw thread upon the auger, but with this important though trifling difference, the nut instead of being separate from the handle, and therefore liable to be lost or mislaid, is contained in the handle, so that all that is required is to place the auger in the handle and turn the nut, which, as will be seen, has a collar, which turns freely in a groove in the handle, thus drawing the square shank of the auger firmly into the socket. This is a very convenient implement. For any further information address the inventor.

Indelible Inks, and Paper.

[Abstract of a Lecture on the "Chemistry of Indelible Ink and Paper," delivered before Bacon's Cincinnati Mercantile College, by Prof. Chas. W. Wright, and reported expressly for the Scientific American.]

The basis of most of the so-called Indelible inks of commerce is the nitrate of silver, or lunar caustic. The articles written upon by the nitrate are previously moistened with a solution of carbonate of soda; or ammonia is added to a solution of nitrate of silver until the precipitate produced is redissolved. The latter is a dangerous preparation, as it is liable to give rise to the formation of the fulminating silver, an explosive compound, particularly if it be kept for some time. Nitrate of silver, however, does not make an indelible mark, as all writing executed with it can be discharged by means of chlorine or its bleaching salts.

A truly indelible ink must contain carbon in the solid form as its basis, as this substance has but two solvents, viz., melted iron and strong sulphuric acid, neither of which are likely to be employed in erasing writing. In the form of charcoal we have numerous instances of the indestructibility of carbon. Thus in the Thames River stakes of oak have been recently found, where they are supposed to have been driven at the time of the invasion of Julius Cæsar, the surface of which was charred and in a state of perfect preservation. At Herculaneum the beams of the theatre were carbonized when that city was overwhelmed with lava, 1700 years ago, and are as perfectly preserved now as the day after that sad occurrence. Carbon is the basis of India ink, which is made by incorporating purified lampblack with glue, and moulding it in suitable forms. As the carbon in India ink is not in solution, it does not sink into the substance of paper like the tanno-gallate of iron, a portion of which is in solution, but flows with difficulty from steel pens, and hence cannot be used as an ordinary writing fluid.

Paper is composed of carbon and the elements of water, as can be very readily shown by bringing it in contact with sulphuric acid, which abstracts the water and liberates the carbon. It is fabricated, as is well known, out of linen or cotton rags, which are reduced to a pulp by machinery and incorporated with a size of glue or alumina, by which, when rolled into sheets, its tenacity is increased and it is rendered less porous. When paper is sized with glue and written upon by common ink, containing free tannic acid, it is affected in a peculiar manner, in fact the letters rest upon a basis of leather, as tannic acid, by combining with gelatine forms that substance. When paper is boiled for several hours in very dilute sulphuric acid it is transformed into that variety of sugar which is found in grapes and honey. When heated with nitric acid, carbonic acid is evolved and oxalic acid generated, but if it be digested for a few minutes in strong nitric acid, or a mixture of nitric and sulphuric acids, in equal proportions, at the ordinary temperature, and washed in water and dried, it shrinks slightly, becomes tough, and is highly explosive, in fact it is identical in composition with the gun cotton of Schoenbein.

Various kinds of paper have been invented to resist the arts of counterfeiters and forgers. In 1826 the French Academy of Sciences appointed a committee to discover a paper to be used for deeds, bank notes, &c., that could not be tampered with without detection. The device agreed upon consisted in covering the paper on both sides with microscopic stars, a delible ink being used, which would be destroyed by the chemical agents employed in erasing writing. Another process intended to accomplish the same purpose, consists in incorporating iodide of potassium, starch, and yellow prussiate of potash with the materials for fabricating paper. When chlorine is applied to such paper to discharge writing, iodine is liberated, and by combining with the starch forms the blue iodide of starch, and the application of acids would give rise to Prussian blue, by the re-action of the iron of the ink on the yellow prussiate of potash. Neither of the above processes are of much value, however, as an expert engraver and chemist could overcome any obstacle which they might present in the prevention of forgery and counterfeiting.

Parchment which was extensively used as a writing material in ancient times, is rarely employed at the present day, except for diplomas. It is prepared from the skins of animals, and is written upon with difficulty by ordinary ink, from its generally being slightly greasy. This difficulty is readily overcome by moistening the parchment very slightly with the water of ammonia, or by adding a little of that substance to the ink just before using it. If the ink contains free tannic acid, the letters rest upon a basis of leather, as in the case of paper that has been sized with glue.

Trial of Pumps.

A trial of pumps came off at the Madison House Covington, on Wednesday, between McGowan's pump and Dodge's patent pump, both being double action. At the first the bystanders were nearly all in favor of Dodge's pump. But when they commenced playing through the nozzles, the tables turned in favor of the Little Buckeye. The McGowan pump beat the Dodge pump about eight or nine feet horizontally, and twelve or fifteen feet perpendicularly, as near as could be judged. The Dodge pump filled a pail in five seconds, and the McGowan one, in about three and a half seconds. The relation of the pumps were thus:—The Dodge pump was three inches bore, and the McGowan one two and a half inches—both pumps having five inches stroke. We heard McGowan say that if Mr. Dodge's agent thinks there was not fair-play at the trial, he would try with him in Cincinnati, provided he would try his pump with a thirty foot suction.—There were competent judges appointed, to see that the trial was fair on both sides.—[Cincinnati Daily Times.

There is said to be great demand in Jackson, Tenn., for carpenters, bricklayers, painters and plasterers.

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